

ABSTRACT OF THE DISCLOSURE

A sigma-delta converter operates over a predetermined bandwidth and includes a feedback loop comprising a forward path and a feedback path. The forward path includes, in series, a summer, a filter, and a comparator. The comparator produces an output signal that is fed back to a negative input of the summer via the feedback path. The sigma-delta converter also includes at least one instability generator positioned in the forward path and/or the feedback path. The instability generator generates one or more out-of-band instabilities in the feedback loop to substantially improve the in-band signal-to-noise performance of the converter for input signal amplitudes near a low end of the converter's dynamic range. The converter may be employed as an A/D converter, a D/D converter, or a D/A converter in a receiver and/or a transmitter of a wireless communication device.